

Making Waves with a Slinky Activity

For each activity, you should have the slinky stretched across the floor, with your partner at one end and you at the other. Decide which partner will shake the end of the slinky, and which partner will hold their end still.

Be careful with the slinky's! Do not let go and let ends fly into each other, and do not whip the slinky wildly. It will get tangled very easily. If it does, you will receive 0 for assignment!

1. Shake one end of the slinky. You should see waves travel down the slinky to the other end. The waves move across the slinky, but the slinky moves up and down **perpendicular** to the wave motion.

These waves are (**Transverse or Longitudinal**)? _____

Draw the wave:

2. Push or pull on the end of the slinky. You should see waves travel down the slinky to the other end. The waves move across the slinky, and the movement of the slinky is in the same direction to the wave motion.

These waves are (**Transverse or Longitudinal**)? _____

Draw the wave:

3. Now shake the slinky with different amounts of energy, making large or small **transverse waves**. How far the wave moves (up or down) from its resting position (also how big or powerful the waves are) is called the wave's (**Wavelength or Amplitude**)?

Draw 2 waves you made of different amplitude's. Label the one that has the largest amplitude

4. Now shake the slinky up and down faster or slower. You will make more or less waves. How often the wave moves up or down per second (the wave cycle) is the (**speed or frequency**)? _____

Draw 2 waves you made of different frequencies. Label the one that has the highest frequency

5. The distance between the tops of each wave (their **crests**), or the distance between the bottom of each wave (their **troughs**) is known as (**amplitude or wavelength**)?

Draw 2 waves you made of different wavelengths. Label the one that has the longest wavelength

6. You may notice the faster you shake the slinky (**higher frequency**) the smaller the distance between the waves (**shorter wavelength**), but the slower you shake the slinky (**lower frequency**) the bigger the distance between the waves (**longer wavelength**).

Thus:

A **high frequency** wave has a (**long or short**) _____ **wavelength**

A **low frequency** wave has a (**long or short**) _____ **wavelength**

A wave with **long wavelength** has a **(low or high)** _____ frequency

A wave with a **short wavelength** has a (**low or high**) _____ frequency

7. Do waves with **large amplitudes** travel down the slinky with the same speed as waves with **small amplitudes**? Try and find out.

Does amplitude affect the speed of a wave? (**Yes or No**) _____

8. You may remember from the video notes that only the **medium** affects the speed of the wave. Try stretching the slinky more (but not too much or it will break) to see how it affects the speed of the wave.

- a) What does **medium** mean when talking about waves?
- b) How did stretching the slinky medium more affect the speed of the wave?